

NOTEBOOK COMPUTER HINGE**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to a hinge for a notebook computer, particularly to a hinge comprising a pivotal bearing seat with a set of spring devices received therein, a limit plate and a pivot, which is either rotatable or fixable reversibly in a position in a pivot socket defined in the spring devices.

2. Description of Related Art

Because the notebook computers are highly mobile and efficient in handling business matters, the number of people who use notebook computers is increased. Furthermore, the development of internet even promotes the use of notebook computers. In order to meet the requirements under all circumstances, a hinge device pivotally connected between the screen and the body is necessary to provide substantial and suitable support to the screen, such that the screen is able to be opened from the body at any desired angle hinge device. However, the conventional hinge devices for notebook computers generally comprise a pivotal bearing seat with a transversal or a longitudinal spring piece provided therein, which incurs drawbacks:

- 1 The structure of the conventional hinge devices using two different spring pieces are complex and the fabrication cost is high;
- 2 The support provided by the spring pieces to the screen is not strong enough. Therefore, the screen may not be securely fixed at a desired angle.

SUMMARY OF THE INVENTION

The main object of the present invention is to provide a hinge device for a notebook computer. The hinge device comprises a pivotal bearing seat with spring devices received therein, a limit plate and a pivot. With such an arrangement, the screen has support in the opening direction and the closing direction. What's more is that the fabrication cost of the hinge device is greatly reduced. Hinge device

The detailed features of the present invention will be apparent in the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a hinge in accordance with the present invention;

FIG. 2 is a side view in partial section of the hinge, in FIG. 1; hinge device

FIG. 3 is a side view of the hinge in FIG. 1 installed in a notebook computer;

FIG. 4 is a side plan view of the hinge in FIG. 1;

FIG. 5 is an enlarged cross sectional view of the hinge along the line 5—5 in FIG. 2;

FIG. 6 is a front plan view in partial section showing alternative oil slots defined in the hinge in FIG. 1;

FIG. 7 is a front plan view in partial section showing oil slot different from that shown in FIG. 6;

FIG. 8 is an exploded perspective view of a second embodiment of the hinge in accordance with the present invention;

FIG. 9 is an exploded perspective view of a third embodiment of the hinge in accordance with the present invention;

FIG. 10 is an exploded perspective view of a forth embodiment of the hinge in accordance with the present invention; and

FIG. 11 is an exploded perspective view of a fifth embodiment of the hinge in accordance with the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

As shown in FIGS. 1 to 3, a hinge in accordance with the present invention comprises a pivotal bearing seat (10) with spring devices received therein, a pivot (20) and a limit plate (30).

The pivotal bearing seat (10) is securely attached to the main body (11) of a notebook computer and defines a bearing hole (12) through the pivotal bearing seat (10) and a transverse H-shaped groove (13) defined to communicate with the bearing hole (12). Two limit blocks (15) are integrally formed on opposite sides of the open end of the bearing hole (12).

The spring device include a first spring (50) and a second spring (60). The first spring (50), which is a hollow tube, has two legs (51) integrally extending outward therefrom, a block (52) securely connected to both legs (51), a lubricating groove (53) defined on the outside surface, a first through hole (54) defined therethrough and a slit (55) axially defined therein. The second spring (60) is a mirror image of the first spring (50) with two legs (61), a block (62) securely connected with both of the legs (61), a lubricating groove (63) peripherally defined therein, a second through hole (64) defined therethrough and a slit (65) axially defined therein. The blocks (52, 62) are attached to the respective pair of legs (51, 61) on opposite sides and the slits (55, 65) are on opposite sides, such that the first spring (50) and the second spring (60) are able to provide support in opposite directions.

The pivot (20) has an extension (21) integrally formed on one end to attach the screen (25) of the computer and a spindle (22) formed on the other end with multiple lubricating slots (222) defined therein. A shoulder ring (23) is integrally formed between the extension (21) and the spindle (22). The shoulder ring (23) further integrally forms a chamfered boss (231) towards the spindle (22).

The limit plate (30) integrally forms a sectional portion (31) and defines a chamfered hole (32) corresponding to the chamfered boss (231) of the spindle (20), so as to allow the chamfered boss (231) to be received in the chamfered hole (32).

During assembly, the first spring (50) and the second spring (60) are first inserted into the bearing hole (12) of the bearing seat with the blocks (52, 62) received in the T-shaped groove (13). The spindle (22), after being inserted through the chamfered hole (32) of the limit plate (30) (as shown in FIG. 4), is then inserted into the first through hole (54) and the second through hole (64) to have an interference fit with the peripheries defining the first through hole (54) and the second through hole (64).

Referring to FIG. 5, after the assembly of the hinge is complete, the limit plate (30) is still pivotal on the spindle (22). However, due to the limit blocks (15) beside the bearing hole (12), the pivotal movement of the limit plate (30) is limited to correspond to the opened and closed angles of the screen (25) with respect to the main body (11). FIGS. 6 and 7 show that the lubricating grooves (53, 63) of the first spring (50) and the second spring (60) can be defined through the respective periphery thereof or defined superficially in the respective periphery thereof.

Referring to FIGS. 8, 9, 10 and 11, the differences among the embodiments shown in the drawings is primarily in the form of the legs (51, 61). As shown in FIG. 8, the first and